REMARKS

Entry of the foregoing and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

Claims 1-10 were pending in this application. In this response, claims 1-10 are amended; no claim is canceled; and claims 11-20 are added. Thus, claims 1-20 are pending.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: the original claims, Figures 2-4 and the specification, pages 7-9, paragraphs 24, 27, and 29.

Entry of this Supplemental Amendment is proper under 37 C.F.R. § 1.111, because the amendment adopts suggestions by the Examiner, and because the Supplemental amendment was authorized by the Examiner during the interview held August 19, 2009.

Summary of Examiner Interview

As an initial matter, Applicants express gratitude to Examiner Peche and Examiner Tran for the courtesies extended Applicants' attorney during the recent interview of August 19, 2009. During the interview, the Examiner expressed his positions regarding the rejections made under 35 U.S.C. § 112, 1st paragraph and 35 U.S.C. § 103. Specifically, the Examiner suggested removing the limitation "whose location is accurately known" in the second work area, and adding limitations that tie the claims to the embodiment of Figure 2. Above is an amendment to the claims consistent with discussions with the Examiner. The Examiner expressed that these amendments could be made and would be considered in a Supplemental Amendment.

Claim Rejections Under 35 U.S.C. §112

Claim 1 and 8 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement on the grounds set forth at page 2 of the Official Action. The Examiner alleges that claims 1 and 8 lack enablement because the invention fails to disclose "with no identifier whose location is accurately known." Applicants amended claims 1 and 8 to remove "whose location is accurately known" as suggested by the Examiner to overcome the rejection. Accordingly, Applicants respectfully request withdrawal of the rejection.

Claim Rejections Under 35 U.S.C. §103

Claims 1-10 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over International Publication No. WO 01/69041 A1 to Hakkinen (hereinafter "*Hakkinen*") in view of the published article "Mobile robots evolving in industrial applications" to Lehtinen et al. (hereinafter "*Lehtinen*") on the grounds set forth at page 3 of the Official Action. The Examiner alleges that *Hakkinen* discloses many of the elements of claims 1 and 8. However, the Examiner admits that *Hakkinen* fails to disclose a method for determining the location of the mining vehicle substantially continuously in the first work and the second work area on the basis of a dead reckoning, wherein the distance traveled is calculated and the travel direction is determined, determining, when operating in the second work area, the location of the mining vehicle only on the basis of the dead reckoning; updating the location data determined in the dead reckoning on the basis of the location data of the identifier when driving in the first work area; and a method comprising the second work area is provided with no identifier whose location is accurately known. *See, e.g.*, p. 4 of the Office Action dated January 2, 2009. The Examiner further alleges

that *Lehtinen* cures these deficiencies by using a dead reckoning unit on mining vehicles to determine distance and direction, and identifiers in the form of beacons, transponders or landmarks to update the location determined by the dead reckoning unit.

Applicants respectfully traverse the rejection. The Examiner appears to state that *Lehtinen* discloses a first work area with identifiers and a second work area without identifiers. To make the disclosure of *Lehtinen* include a first work area with identifiers and a second work area without identifiers, the Examiner appears to interpret first and second work areas to be any location with any size. By interpreting the work areas in this way, the Examiner arbitrarily divides up the single work area disclosed in *Lehtinen* into areas precisely at a landmark as first work areas and the area between that landmark and the next one as a second work area.

Although Applicants believe the interpretation of work areas by the Examiner is unreasonable in light of the specification, the claims have been amended to incorporate a third work area containing the identifiers as suggested by the Examiner. Claims 1 and 8 each now recite "wherein the size of the second work area is sufficient to cause a mining vehicle passing from the first work area through the second work area to the third work area to have discontinuities in location updates obtained by identifiers with accurately known locations." In contrast, *Lehtinen* is silent to second work areas without identifiers that cause discontinuities in location updates obtained by identifiers found in first and third work areas. *Lehtinen* discloses that the opposition estimation is updated continuously. *See, e.g.*, page 98, left column, last sentence. Further, as explained by the Examiner, the landmarks of *Lehtinen* are spread across the work area at a certain distance (e.g. 20 meters), which is not a size large enough to cause discontinuities in location updates obtained by those landmarks. Further, it would not have been obvious to spread the landmarks further, because then the system could no longer update

continuously as required by *Lehtinen*. Thus, *Lehtinen* merely discloses a first work area where the identifiers are spread in a manner that enables continuous updates, and no second work area without identifiers.

Hakkinen also fails to disclose the mining vehicles passing through a second work area when travelling from a first work area to a third work area, where a discontinuity of location updates is caused by the second work area without identifiers. For at least the above reasons, *Hakkinen* and *Lehtinen* fail to teach all of the elements of claims 1 and 8. Dependent claims 2-7 and 9-10, which depend from claim 1 or 8, respectively, are also not obvious for at least reasons similar to those for claims 1 and 8. For at least these reasons the rejection should be withdrawn.

Additionally, claims 11-20 are added and are not taught by *Hakkinen* and *Lehtinen*. Independent claims 11 and 18 each recite "wherein the size of the second work area is sufficient to cause a mining vehicle during at least one work cycle to have discontinuities in location updates obtained by identifiers with accurately known locations." As explained above *Lehtinen* fails to disclose a second work area without identifiers that is of sufficient size to cause discontinuities in location updates obtained by identifiers found in the first work area. At most, *Lehtinen* merely discloses a first work area where the identifiers are spread in a manner that enables continuous updates, and no second work area without identifiers.

The Examiner has also alleged that *Hakkinen* also discloses first and second work areas. In *Hakkinen*, mine galleries, which have not yet been mined, are marked with reference number (1'). When new mine galleries are excavated blasting holes are first drilled in the end of the tunnel by means of drilling rig (4), which is remote controlled by a human. Then the end is blasted, and broken rock is removed by means of a loading vehicle (5), which is also remote

controlled by a human. As it is taught in *Hakkinen*, these two production vehicles are not provided with any measuring devices.

The claims recite that the location of the mining vehicle is substantially continuously determined in the first work area and the second work area on the basis of a dead reckoning. In *Hakkinen*, the location of the drilling rig (4) or the loading vehicle (5) is not defined continuously in either the already mined section or the mine sections not yet being mined. Thus, *Hakkinen* fails to disclose the claimed first and second work area.

Further, in the Office Action dated January 2, 2009, the Examiner states that it would have been obvious to replace the inertial measurement device of a measuring vehicle (3) of *Hakkinen* by a dead reckoning device of *Lehtinen* and incorporate it in the production mining vehicles (4, 5) of *Hakkinen* to continuously determine the position, especially when new galleries are mined. However, an inertial measuring device is an exact device the operation of which is based on the gravitational fields of the earth, as disclosed in page 2, lines 19-23 of *Hakkinen*. Dead reckoning devices have the disadvantage that, for example, tire slippage causes inaccuracy. Therefore, Applicants submit that it would not have been obvious to substitute the accurate inertial measuring device with the more inaccurate dead reckoning device.

Further, *Hakkinen* discloses placing the inertial measuring device only on the measuring vehicle and not the production mining vehicles (4, 5). In contrast to the Examiner's conclusion, *Hakkinen* teaches away from adding any type of measuring device to the production mining vehicles, because the goal of *Hakkinen* is to have a measuring device measure and mark the mining areas so that the production mining vehicles can operate without the expense of measuring devices.

Further, even if, arguendo, it were obvious to place measuring devices on the mining vehicles of *Hakkinen*, *Hakkinen* fails to disclose a second work area of sufficient size to cause a mining vehicle during at least one work cycle to have discontinuities in location updates obtained by identifiers with accurately known locations. The Examiner alleges that *Hakkinen* teaches mining vehicles working to clear a new gallery, which is not marked when originally clearing the gallery. However, *Hakkinen* clearly indicates that the rock drilling apparatus (4) is directed into position for drilling by the markings/identifiers prepared by the measuring device. *See, e.g.*, p. 4, l. 34 – p. 5, l. 22. The pre-marked mine with the rock drilling apparatus beginning to drill out a new portion of mine is shown in Figure 2. Although it is agreed that the immediate portion of the mining area that has been drilled and unloaded before the measuring device can go in to mark would not have an identifier, it is not agreed that that immediate portion of the mining area is of sufficient size to cause discontinuities in location updates obtained by identifiers with accurately known locations. In contrast, *Hakkinen* discloses a mining method in which a portion of a new mine shaft is drilled and cleared by mining vehicles whose locations are continuously updated via the markings/identifiers. Once a new portion is drilled and cleared the measuring vehicle reenters the mining area and marks the new portion before the drilling apparatus drills the next section. There is no suggestion or expectation of success in the method of *Hakkinen* to drill a section of mine without marking that is of sufficient size to cause discontinuities in location updates. To the contrary, *Hakkinen* suggests the opposite by requiring continuous location updates and use of mining vehicles without any measuring devices.

Additionally, the combination of *Hakkinen* and *Lehtinen* teaches away from a second work area without identifiers as it is defined in the claims. *Lehtinen* teaches to spread landmarks across the route so that continuous updating is possible. The Examiner mentions that landmarks

could be placed at 20 meter intervals throughout the mining area in which the vehicles will be working. To place landmarks in a manner that allows for continuous updating requires a great number of identifiers and advance information of the route to be driven. Furthermore, *Hakkinen* teaches that a new mine gallery has to be first measured and marked with markings before other mine vehicles can operate in the new gallery. Thus, a great deal of advance information is also needed in *Hakkinen*. Whereas the method and system of the claims can work in a second work area where there is little or no advance information, with no identifiers, before coming back to a first work area that is marked and measured as required in *Hakkinen* and *Lehtinen* for all working areas.

For at least the above reasons, *Hakkinen* and *Lehtinen* fail to teach all of the elements of claims 11 and 18. Dependent claims 12-17 and 19-20, which depend from claim 11 or 18, respectively, are also not obvious for at least reasons similar to those for claims 11 and 18. For at least these reasons the rejection should be withdrawn.

CONCLUSION

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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